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## THE DEMAND FOR CARS IN DEVELOPING COUNTRIES

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**Abstract**—The paper analyzes the misunderstandings that have occurred in dealing with the private vs public transportation issue in developing countries. Both the economic view of the car as just a “free consumer desire”, and the psychological views of the automobile as symbol of “freedom”, “status” and “power” are criticized. An alternative sociological approach to the automobile is proposed, based on transport technology as embedded in the contemporary pattern of social reproduction. It is argued that the demand for automobiles, in addition to its utility, has been induced by urban, economic and transportation policies directed towards selected social sectors — the middle classes — who in turn perceive the car as an essential tool for their social reproduction. The same policies keep transit alternatives impractical. Consequently, there are important political (and not psychological) obstacles to alternative, less auto-oriented urban transportation policies. © 1997 Elsevier Science Ltd. All rights reserved

### 1. INTRODUCTION

In the last three decades, the rapid growth of large cities in the developing world has been accompanied by a growth in car ownership, profoundly changing the traffic circulation conditions within these cities.\* Transportation planners seem to be headed down a dead-end street: the increasing use of the car seems unavoidable, as it appears as something people “naturally desire” to have and use, and as something attached to symbols of status, power and self-affirmation. This approach to the problem has been leading to either conservative policies reproducing automobile dominance or to efforts aimed at generating voluntary shifts to public transportation. In the first case, conservative policies are justified as answers to consumer desires. In the second case, transport planners initially believe the shift is convenient and viable, however when faced with the driver’s refusal to use transit often blame the “insensitive people” who supposedly persist in their “selfish” behavior of traveling by car. In both cases, automobile dominance appears as inevitable and alternative transit-oriented policies seem unrealistic.

I argue that basic misunderstandings have occurred in analyzing this problem, with important impacts on transport policy decisions in the developing world. The misunderstandings relate to both the supposed psychological characteristic of car ownership, as a “desire for power and status,” and the economic assumption of car purchase as resulting from a “free consumer choice.” On one hand, the psychological approach is superficial, having a weak explanatory power with respect to the actual motives that induce people to commit themselves to buy and use automobiles. Conversely, the traditional economic view is inadequate to understand developing countries’ context, where market failures abound and most people have no choice other than use public transportation. I argue that the effective demand for cars, in addition to its utility, is influenced by urban, transport and economic policies, which shape space and confine transport choices. Moreover, demand is socially determined, in the sense of being related to how social groups and classes — especially the middle class — see and interpret the process of economic modernization in contemporary capitalist societies. In this respect, the automobile is perceived by the middle classes as essential to perform their desired daily activities, that is, to ensure their social reproduction. Therefore, reactions against car restraint measures have a political nature, rather than a psychological one, posing important obstacles to alternative, less auto-oriented policies.

\*The average annual population growth for 27 selected cities in developing countries in the 1970–80 period was 4.9%. The corresponding figure for car ownership increase was 8.9% (18 cities). See Banjo and Dimitriou (1990), Table 2.1.

Traditional approaches being inadequate, and actual transport choices being confined, conservative policies that intend to generate an automobile-oriented space as an answer to "free consumer desires" are unjustified in the developing world, on technical and social grounds. Similarly, attempts to reduce car usage without a proper understanding of its valuation turn out to be a waste of time. Therefore, transportation planners in developing countries should avoid misinterpretations and search for the actual factors that make the car "demanded." A better knowledge would help them develop better socially and environmentally sound transport policies.

The main objective of this paper is to search for a better explanation of the automobile's importance in contemporary developing societies and to help explain why there are limits to alternative, less auto-oriented urban transportation policies. As a complement to prevailing views of the automobile, I propose a more revealing sociological approach, which I believe goes furthest in explaining auto demand. This approach sees transport technology embedded in the contemporary pattern of urban social reproduction and, for several reasons that will be discussed later, associates the use of the automobile with the new middle class lifestyle that corresponds to capitalist modernization in developing countries. Therefore, middle class interests and political power with respect to urban circulation, and the role of urban, transport and economic policies in shaping accessibility and general travel conditions, are considered highly relevant to an understanding of the demand for cars in the developing world.

Section 2 proposes a sociological view of the automobile by analyzing the supply and use of the transport system as a tool for understanding the mobility of social groups and classes. Section 3 considers the specific conditions of urban and economic development in developing countries, with an emphasis on the Brazilian case. Section 4 analyzes the demand for cars in these countries using the proposed approach. Finally, Section 5 summarizes the main conclusions and briefly discusses the limits and possibilities for alternative urban transportation policies.

## 2. APPROACHES TO AUTOMOBILE DEMAND

### 2.1. *Conventional views of the automobile*

The meaning of the automobile in modern and contemporary societies is multifaceted: no single facet alone can explain why this technology has so profoundly influenced our lives. Roland Barthes, a French philosopher, wrote of the automobile's cultural position as "the Gothic cathedral of modern times" (quoted in Sachs, 1992). Just as the cathedral is not merely a shelter, the automobile is not only a means of transport. One has to consider several aspects of the car culture when analyzing its importance in our society. I believe four conventional views encompass most conceptions about the car. The first conventional view — anthropological — is that of the automobile as symbol of power, status, wealth, related to the linkage that it can create between possession, public appearance and the wealth of its owner. The second view — political — corresponds to symbols of freedom and privacy. The third vision — psychological — corresponds to the ideas of youth and athleticism, self-reliance, and personal pleasure. The fourth view — economic — relates to the utility of the car, as a technology that allows for an unprecedented amount of mobility and provides the most efficient trip-chaining capability. According to this view, the decision to buy the car — and the resulting rejection of public transportation — is seen as a natural consequence of a rational comparison between benefits and costs of several consumption possibilities. This vision is supported by a large economic literature (Button, 1982; Small, 1992). It represents an important change because it supersedes the drawbacks of the superficial approaches described before, by proposing the actual utility of the car as the main factor explaining its valuation.

The anthropological, political and psychological views are integrated in the discourse of daily life, whether in people's conversations as consumers, in industrial establishment communication, or in the general media. Within the latter, the advertising and marketing sectors are areas that best understand and manipulate these multiple views while motivating automobile purchases. The anthropological (group symbolism) and psychological (personal pleasure) views are the most superficial in explaining auto purchase and use, despite corresponding to actual values and expectations clearly extant in certain social sectors or age-groups in contemporary industrial society. The political view (mobility as freedom) is more powerful as an explanatory tool, related to the very essence of the ideology of capitalism itself, and particularly of capitalist modernization.

Finally, the economic approach is indeed the most powerful, connected to the nature of the consumer society and the corresponding rational decisions. It is largely used in the official discourse, as supporting automobile-oriented policy decisions.

Yet all these views are insufficient in explaining the degree of either automobile purchase or daily usage in the developing world. First, the expansion of the automobile industry and the large volume of automobile purchases are not solely a consequence of these marketing efforts or of the industry's communication ability.\* One cannot imagine that this success was caused by people's "irresistible" attraction to automobiles as goods. People, as political beings inside social classes and groups of an industrial society, cannot be seen solely as potential "consumers" who throw themselves blindly into the purchase and use of an offered commodity. The decision to buy such an expensive commodity, often requiring years of monthly payments, cannot be compared to the decision to buy a shirt. There must be other reasons behind the decision to buy the automobile technology and they must relate to both the specific conditions within which this technology is offered and the way people imagine the car in addressing their needs.

Second, the use of the traditional economic approach is inappropriate in developing countries. First, it groups everybody into a homogeneous set of potential "consumers." However, when considering the rather long distances to be traveled in large towns, and the prevailing income distribution, most people have no choice at all other than to use public transportation. Therefore, consumer choice models are meaningless. In addition, the use of this modeling procedure to analyze the case of the selected groups which can afford to have cars is also inadequate, for all sorts of market failures are found as underlying their supposedly enlightened and free decisions: there is no perfect competition; transport prices are not defined at the marginal level; consumers have insufficient information about prices and services; and the costs of transport externalities (accidents, congestion, pollution) are not properly imposed on those who cause them (Bayliss, 1992).

Third, the statement about the "obvious utility" of the car as explaining purchase is a truism. It either closes the analysis or throws the analyst in the wrong direction, that of concluding that if people "demand" cars we should therefore just provide them with cars, and also streets and parking facilities, without considering the complex relationship among land use, social and economic factors, and transport demand.

Therefore, it is important to analyze other dimensions of these processes to understand the motives that shape the significance of the automobile. Who sees the car as a utility and under what conditions? How the built environment and the prevailing transport infrastructure influence the need to buy and use a car? How the automobile compares to alternative public transportation means? To accomplish this task, a sociological approach to the automobile within contemporary society is needed. It complements the economic approach by combining the idea of the utility of the car with the urban, social and political contexts where the automobile is offered as a transport technology.

## 2.2. *The proposed approach*

A sociological approach to transportation differs from the simple economic approach in three ways. First, transport technologies are analyzed in respect to a given urban structure (Castells, 1977), within specific social, economic and political contexts. Second, the sociological view uncovers the large, uniform set of "consumers" and reveals the internal social and economic differences among social groups and classes, to analyze who is purchasing cars, for what purposes and within which conditions. Finally, the proposed approach relates the demand for cars with the automotive industry interests and needs, as part of larger industrial and economic development projects.

The sociological approach to the automobile will therefore be developed by analyzing transport patterns in contemporary urban areas of developing countries, as influenced by their specific

\*Sachs states that "Car commercials use these significations to do their best to keep them alive... They... do not draw their power of persuasion just from the inventiveness of graphic artists, rather they found the very melody that originated with the bicycle and that accompanied the use of automobiles and motorcycles: the joy of minor emancipation thanks to easy mobility" (Sachs, 1992, pp. 108). Conversely, Stokes and Haller place a high importance in the power of the media to create dependency on cars and hence to revert the situation if another transportation policy is designed; this seems to be exaggerated according to the views expressed in this paper. See Stokes and Haller (1992).

social, economic and political conditions. Considering the profound differences among these countries, I focus on those that already have a large industrial base and already use a large fleet of motorized vehicles, such as Brazil, Mexico, Venezuela, South Korea, Indonesia.

In addition, the proposed approach will be developed around three main concepts that will be explained below. The first is the “reproduction” of social classes, as those consumption activities that allow people to ensure living conditions for themselves and their families inside a particular economic system (e.g. work, education, health, leisure, shopping). The second is the “means of collective consumption,” as those facilities (schools, hospitals, streets, parks) and tools (vehicles) which allow people to accomplish these activities (Castells, 1977; Preteceille, 1981). The third is the “transport (and consumption) strategy,” representing the decisions taken by individuals and their families to organize their daily movements, and the corresponding “time and space budgets”: they represent the amount of time and money that have to be consumed, and the distances that have to be traveled by people within the living space, in order to perform the desired activities (Hagerstrand, 1987).

### *2.3. Reproduction of social classes*

To continue to live and participate in society, people have to develop several activities. They also have to support other people who, for several reasons, depend on them. This set of activities, which are believed necessary, ensure people their “reproduction”, both in individual terms and with respect to their social class or group, when essential needs and values are preserved or enhanced.

Reproduction requires consumption activities that can be biological — food, water, clothes, shelter and health services; intellectual — education, political and cultural activities; and social— as social gathering, leisure, sports and recreation.\* The range of these consumption activities, and their specific nature, varies in time and space. They also vary according to social, cultural, racial, religious, ethnic and economic characteristics. The most important characteristic of modern urban consumption is that it has been increasingly subjected to collective rules — e.g. water and electricity distribution, sewage and garbage disposal, housing and transport, entailing important equity and welfare issues. The most important feature of activities themselves is that they are socially determined, that is, they are felt, expressed and satisfied according to the specific conditions faced by people in society.† Therefore, in such complex contemporary urban environments people will establish strategies of consumption, which will depend on social, economic and physical (urban) conditions. The strategy will include selecting transport alternatives, and defining the way vehicles, streets and sidewalks will be used. Consequently, the final patterns of consumption and transport will present sharp differences among people, social groups and social classes.

In capitalist societies, complex class structures pose specific problems and constraints to the analysis of the reproduction process. Social mobility and migration further complicate the analysis. In addition, developing countries present three specific characteristics as influencing transportation policies: the state plays a prominent role in shaping economic development, as opposed to free, deregulated economies in the industrialized world (Martins, 1985); the decision-making process is far from democratic, with ruling sectors having a tight control over policy decisions (Cardoso, 1977); finally, profound social discrepancies, economic instability and widespread informal economic activities are often the rule (Banjo and Dimitriou, 1990). Therefore, transportation policies have to be analyzed in the face of these specific characteristics, and have to consider the relative interests and power resources of all relevant actors.

### *2.4. The use of the space*

While circulating, the user develops wanted or needed activities interrelated by a time and space network. The daily operation of this network is done by people considering personal techniques to optimize time and cost, implying space and time “budgets” (Hagerstrand, 1987;

\*The forms relate to each other but this simple division is considered adequate for the purposes of the paper.

†There are no “natural” needs other than biological. Consequently, nobody has the “natural” need to buy a car. It is obvious that to eat, to drink water and to use clothes against inclement weather are actual needs, regardless of the economic system. But the point is that the way these needs are felt, expressed and satisfied are themselves socially determined, having therefore specific characteristics in every case. For a detailed analysis see Preteceille and Terrail, 1985.

Goodwin, 1981). The decisions are highly constrained by the social and economic characteristics of the users and their families: a strong positive relationship exists between income and quantity and diversity of trips, and also between income and use of private transportation. The activities are also constrained by the physical structure of the city (inherited from the past), by the physical disposition and time of operation of urban equipment and facilities and by the available transportation means.

Different physical, social, and economic conditions combine to provide a set of travel possibilities that are found in contemporary societies. Considering the widespread urbanization process, urban activity networks are becoming increasingly larger and motorized transportation means are becoming dominant. Among them, the private automobile is by far the most efficient in optimizing network performance, given its flexibility.

Many authors have acknowledged this particular condition of the automobile, although in different ways than proposed in this paper. Buchanan (1963, p. 195) says that "the attractions of private cars are so great... there can be no denying the difficulties of providing public transportation services so intrinsically convenient." Stone (1971, p. 99) recognizes that the attractiveness of the car can be explained because "the random route system approximates a door-to-door transportation system." Orfeuil (1994, p. 39) stresses for developed countries that "suburbanization is rational at the individual level." Finally, Weber (1991, p. 274) says that "people everywhere are attracted to cars not because they are lovable nor because they are prestigious, but because they offer better transport services." These views reinforce the economic approach to the valuation of the automobile, as related to its general utility. However, as previously emphasized, these views do not directly address the convenience of the car on sociological grounds, that is, relating the use of this technology — and therefore of alternate technologies — to social classes and groups, their needs and interests, and the context within which the technology is offered: the car does not run alone and one has to analyze who, within which conditions, has decided to purchase and use it.

Other authors have scrutinized the issue through a sociological approach. Whitelegg, for instance, states, *(the) car... shapes the whole lifestyle (and)... creates a subtle dependence on itself (italics added)... in many parts... it is not possible... to reject car ownership... the car is the center of a complex web of lifestyle organization which sets it apart from many other consumer durables (Whitelegg, 1981).*

Reichman (1983, p. 100) also acknowledges that "many factors support the idea that the car implies a whole lifestyle and mobility strategy." Finally, Bernard and Julien (1974, p. 100) stress that the use value of the car "is not explained by an abstract preference for this mode... The needs of transferring (between points) entails a need to effect certain trips by car, without alternatives. It is the form that urban space is organized which confers the automobile its use value."

These views get closer to a more delimited sociological approach to the car because they manage to relate its ownership and use to social and political characteristics of the economic development model in which they are immersed, and to the urban structure as well. To understand the distribution of accessibility in the urban areas of developing countries, and the role played by the automobile, it is necessary to analyze how cities were adapted by the capitalist modernization process of the postwar period. This will be done by using São Paulo as a representative case.

### 3. URBAN GROWTH AND TRANSPORT NEEDS IN DEVELOPING COUNTRIES

Economic modernization entails profound changes in the technology of production, with large impacts on land use, urban structure and travel patterns. In addition, modernization requires new educational and technical skills. Considering the prevailing social and economic discrepancies among people in the developing world, the closed nature of the political system, and the limited amount of investments, modernization is not open to everybody and will be limited (in its full impacts) to selected groups.\* In this context, the new pattern of investment generates conditions to improve and sustain economically only selected social sectors, which can join the new development cycle. These social sectors are called "middle classes." Therefore, instead of an economic concept, strictly income-related, I am using here a broader concept of middle classes, as those sectors that

\*After four decades of economic modernization in Brazil, 63.1% of people with 10 or more years earning money in jobs (excluding social security beneficiaries), receive no more than three minimum salaries a month (approximately US\$ 180)(IBGE, 1990).

have cultural, social and economic conditions to commit themselves to and to benefit from the modernization process.\*

How do these middle classes relate to the recent urban changes in the developing world? Large cities in developing countries, within the last three decades, experienced intense growth related to economic modernization and internal migration. In addition, they have experienced an intense process of physical reconstruction and adaptation of the road system as cities were adapted to cope with the increasing number of automobiles. As shown for São Paulo, transportation planning directed some of its most important actions to the enlargement and adaptation of the street and highway systems to guarantee comprehensive spatial interconnections, while traffic management used modern technologies and tools to yield high levels of fluidity. At the political side, these changes were supported by the ideological commitment between the technocracy and the middle classes concerning the process of modernization, and required the improvement of conditions to use private transport (Vasconcellos, 1993). Accordingly, these policies were carried out along with a rapid increase in the number of automobiles, that jumped from 160,000 in 1960 to 1.9 million in 1980. The availability of cars, despite being limited to selected sectors, was facilitated by economic policies in two ways: the financing of car acquisition and the organization of vehicle "consortiums," where people belonging to a limited group contribute for two or three years with monthly payments to receive a car. Besides economic policies, urban policies also worked to ease car use. New land use laws allowed the building of middle class housing and apartment complexes, in newly occupied areas where the state provided adequate infrastructure and appropriate traffic and parking conditions. Conversely, transit captive users (the majority) were subjected to poor transportation conditions.

The reshaping of the urban space corresponded to a new lifestyle, characterized by new, increasingly complex, patterns of consumption and social relations. People's daily activity networks have increased and diversified, with new destinations at often greater distances. This diversification occurred within all personal networks, as capitalist modernization has transformed all social and economic life: in São Paulo, this change led to a 122% increase in the average number of motorized daily trips between 1967 and 1977, as opposed to a 45% increase in population. However, the largest increase has occurred with auto trips, whose participation in the total number of trips rose dramatically: in this period, they almost tripled, compared to a 100% increase in bus trips (CMSP, 1978). Between 1977 and 1987, private transportation share again increased more than public transportation (36 vs 6%) (Table 1).

The large increase in auto trips by limited sectors was related to broader economic and urban changes that deeply affected middle class lifestyles: the daily activity network incorporated new trips, primarily related to private education, private health care, sports, leisure and shopping, with a profound impact on transportation needs. Before, these activities were not done at the same level of intensity, or they were performed free, often within walking distances: before modernization, most middle class children attended neighborhood public schools and used local public health services, and had their leisure playing on the street or on nearby, empty lots. Shopping was done on local small markets and stores, and distant out-of-town trips were limited to national and school holidays, most of them made by intercity bus or railway. Modernization increased

Table 1. São Paulo metropolitan area. Modal split changes, motorized trips, 1967-1987

Mode	Daily motorized trips (1000)					
	1967	%	1977	%	1987	%
Public	4894	68.1	9759	61.0	10 343	55.0
Private	2293	31.9	6240	39.0	8473	45.0
Total	7187	100.0	15 999	100.0	18 816	100

Source: CMSP, 1988.

\*In economic terms, there are no absolute figures to identify the middle class in countries such as Brazil. In addition, there are intermediate subgroups ("lower," "middle" and "upper" middle class), which further complicates the analysis. For the purposes of the paper, I will consider the middle classes as those social sectors which have family monthly incomes higher than 15 minimum salaries (approximately US\$ 900 at the time of the Origin-Destination survey, in 1987). In the Sao Paulo Metropolitan Region, this accounts for about 25% of the population (see Table 1).

activities, distances and costs, both the direct costs (payments for the new services) and the indirect ones, related to the means of transportation needed to accomplish these new activities. Now middle class children go to private schools,\* often located far away from their living place and requiring escorted automobile trips. Private medical services are also spread over the space, shopping is increasingly concentrated in large regional shopping centers,† and streets are closed to leisure activities, as parked and passing cars occupy all available space: leisure is provided in private clubs or in shopping centers, and in the few remaining large regional public parks. In addition, weekend trips are now a common form of leisure, supported by a modern highway system linking the São Paulo metropolitan region to other cities.‡ These new forms of consumption derive from the "commodification" of social relations proper to capitalist modernization.§ The most important consequence of this process in the Brazilian case was the definition of a dividing line between the middle classes and the working classes, to enhance their social and political differences: working classes continue to walk to nearby public schools and medical centers (no longer used by most of the middle class), use transit in longer trips and have most of their leisure playing on the street or on nearby empty lots. The differences in using the space are summarized by differences in mobility rates (Table 2) and trip diversity (Table 3).

Table 2 shows that mobility increases sharply with income. Mobility rates for higher income groups are twice as much as those for lower income groups (all trips), and more than four times higher when just motorized trips are considered. The data also show that in 49% of the families people make less than one motorized trip per day. This increased mobility translates into a more diversified travel pattern for the highest income levels, where frequent additional trips (leisure and

Table 2. São Paulo metropolitan area. Mobility rates, all trips, 1987

Family income*	Autos/house	Share in pop. (%)	Mobility rate (trips/person/day)	
			All trips	Motorized trips
< 240	0.13	20.8	1.51	0.59
240-480	0.29	28.1	1.85	0.87
480-900	0.57	26.0	2.22	1.24
900-1800	1.01	17.2	2.53	1.65
> 1800	1.61	7.9	3.02	2.28

\*Estimated considering that one minimum wage was approx. US\$ 60.  
Source: CMSP, 1988.

Table 3. São Paulo metropolitan area. Mobility rates by purpose and income, 1987 (all trips)

Family income*	Autos/house	Share in pop. (%)	Mobility rate †	
			Work business school	Other‡
< 240	0.13	20.8	0.61	0.17
240-480	0.29	28.1	0.84	0.16
480-900	0.57	26.0	0.99	0.18
900-1800	1.01	17.2	1.14	0.27
> 1800	1.61	7.9	1.35	0.46

\*Estimated considering that one minimum wage was approx. US\$ 60.

†Trips per person per day; it does not include home returning trips.

‡Shopping, health and leisure.

\*While public schools are free, private schools cost about US\$ 400 per child, per month. While the number of children attending public schools in the Sao Paulo Metropolitan Region increased 38% between 1978 and 1990, the corresponding figure for private schools was 122%. (SEADE, 1991)

†From 1966, when the first shopping center was opened to the public, to 1990, 385,000 m<sup>2</sup>. were built, offering 28,050 parking spaces, used by approx. 141,000 automobiles per day. See ABRASC, 1996.

‡For example, trips to the beach (50 miles long) are made by more than 100,000 automobiles on regular weekends and more than 250,000 on Carnival and 4-5 day summer holiday weekends. The automobile AADT increased 152% from 1972 to 1990, as opposed to a 100% increase in the population of the metropolitan area. See DERSA, 1992.

§The broadest economic changes characterize what may be called the 'commodification' of social relations: activities (e.g. leisure) and services (e.g. health care) that were free of charge enter the money circuit, being 'commodified', and people have to pay for them. This process radically changes the relationship among the state (as regulator), the private sector (as supplier) and the user (as consumers).

shopping) are possible. The different travel patterns are associated with different forms of using the space, as the use of transportation means is also highly differentiated (Table 4).

Table 4 shows that the three lowest income sectors travel predominantly by foot or public transportation. Conversely, people at the two upper income levels make motorized trips predominantly by car. These latter households account for approx. 25% of the total number of households in the metropolitan area and represent the social sectors for whom the car is essential.

Finally, journeys to school are also a clear demonstration of differences in using space (Table 5).

It is also important to compare travel conditions between modes. In this respect, car and buses (the leading public transportation alternative) have been remarkably different (Table 6). In 1987, average travel time by car was half that of the bus. In addition, access times to either buses or parked vehicles, which play an important role in defining actual accessibility conditions, were also remarkable different. Finally, the percentage of bus lines with unacceptable loading conditions in the peak-hour (more than 6.2 passengers/m<sup>2</sup>) varied between 32 and 84% in the city (CET, 1984).

A portrait of differences among income groups can be seen by analyzing examples of daily activity networks. Shown below are daily trip patterns of two families with very different social and economic characteristics. The first is a working class family, with a monthly income of about US\$ 360, and no car. The second is a middle class family, with monthly income of US\$ 2400 and two cars. Despite the large diversity found in all families, these two are representative of overall patterns.

Table 7 shows the large diversity in activities and travel conditions. The middle class family made an average of 2.9 trips per person, compared to 1.6 by the working class family. Trips for the middle class family included escorting a child to attend a special class 2.9 km away, shopping

Table 4. São Paulo metropolitan area. Modal split and income, 1987

Family income*	Share in pop. (%)	Modal split (% of trips)		
		Public	Private	Foot
< 240	20.8	37.3	8.8	53.9
240-480	28.1	40.1	13.3	46.6
480-900	26.0	39.6	24.6	35.8
900-1800	17.2	33.3	41.4	25.3
> 1800	7.9	19.6	66.0	14.4

\*Estimated considering that one minimum wage was approximately US\$ 60.  
Source: CMSP, 1988.

Table 5. São Paulo metropolitan area. Journey to school according to the highest and the lowest income levels, 1987, selected districts\*

Monthly family income†	Transportation mode (5)			Average distance (km)
	Foot	Public	Private	
< 240	97	3	—	0.65
> 1800	18	—	82	2.94

\*Three districts for every income level (35 households each). Children under 16 years old only.  
†In US\$.

Table 6. São Paulo metropolitan area. Access time and travel time by mode of transport, 1987

Mode	Access time (min)	Total travel time (min)
Auto	2	23
Taxi	3	25
Bus	13	55
Metro	14	70
Train	20	85

Source: CMSP, 1988.



away from home and carpooling with other middle class families to transport children to a private school 5.7 km away, plus leisure at night 3 km away from home. Trips for the working class family were restricted to a work trip (the father), a visit by foot to a neighborhood doctor (the mother) and walking to the nearby public school (the children). The availability of a housemaid in the middle class household allowed the mother to stay away while keeping a 9-yr old son at home. In the working class family, the 1-yr old daughter was left at home with an older brother (12-yr old) while the mother was away at the doctor's. In 82% of the time spent by the working class family, the middle class family covered three times as much distance. The corresponding average speed is about four times higher. The most important conclusion is that the attempt to replace auto trips by bus (or non-motorized) trips for the middle class family would make the daily schedule infeasible,\* hampering the performance of activities which are perceived as necessary for their reproduction as middle class people: to accept such changes the father would take one hour to get by bus to the workplace, the children would have to attend local public schools, shopping would have to be done by foot nearby, night leisure would no longer be possible and the housemaid would probably be fired. By doing so, these people would no longer "be" middle class people, exactly what they will never accept.

The data analyzed so far demonstrate that activities and travel conditions in the city vary remarkably with income. The most important point with respect to Brazilian conditions (and other developing countries) is that actual conditions establish a dividing line between those with and without access to private transportation. The access to the automobile, limited to selected sectors, generates large differences in accessibility, convenience and comfort, as opposed to public transportation. Accordingly, any automobile users who attempted to replace auto trips by bus trips would face unreliability and discomfort, and would significantly increase total travel time required, rendering infeasible the current middle class daily schedules.

#### 4. THE DEMAND FOR CARS

The analysis made so far helps us to understand why the restructuring of space and the insufficiency of public transportation supply placed the automobile in a unique position, as the sole means of transportation capable of guaranteeing a minimum level of efficiency with respect to existing public transportation. Therefore, the decision to use the car, for those who could afford it, was rational, but deeply influenced by prevailing conditions. In these specific contexts, the purchase and use of the car have therefore to be seen primarily as a class decision, not an individual one in the narrow sense of the term. Even if personal preferences are activated to select the product (e.g. color, size), the major decision is to buy (and use) the specific technology called automobile, as opposed to alternative technologies. This decision is socially determined, in the sense of fulfilling the perceived needs of a particular group, the new middle class created by modernization. If other urban, transport, social and political conditions were present, other purchasing decisions would be made. Consequently, in sociological terms, one can say that the automobile turned itself into a means of class reproduction, a vital tool for the very existence and reproduction of the new

Table 7. Daily travel patterns of two different families (examples)\*

Data	Middle class family	Working class family
Persons	7 (one housemaid)	5
Autos	2	0
Income†	2400	360
Trips	20	8
Modes used	Car; carpool; foot	Bus; foot
Purposes	Work; school (private); shopping; leisure (at night)	Work; school (public); doctor
Distances (km)	51.8	16.3
Time (min)	210	255
Speed (km/hr)	14.8	3.8

\*Examples drawn from the 1987 O-D survey (25,000 households).

†Monthly income in US\$.

\*The automobile chaining capability plays an important role: in selected districts, for the three highest income levels, automobiles account for a minimum of 40% and a maximum of 80% of chained trips.

middle classes generated by the income concentration process. To “be” a middle class citizen required the performance of a set of new (commodified) social, cultural and economic activities, whose time-space optimization relies on the car: as previously shown, the attempt to perform these activities by bus (or non-motorized means) would result in disaster. Therefore, for the middle classes described in this paper, the decision to buy the automobile is similar to decisions about enrolling children in private schools, paying private medical care, studying foreign languages, going to restaurants, making weekend trips and even travel abroad. These are all class decisions, to fulfill activities that are believed to maintain and reproduce people in the way they think they have to reproduce themselves and their children, to remain members of a class, or to achieve social mobility. Moreover, these activities are also believed necessary because they clearly separate the middle classes from the working classes. Considering prevailing spatial arrangements and the supply of public transportation, the automobile is the sole technology that can combine these activities efficiently, in a ‘trip chaining way,’ and the decision to buy the car follows logically.

In addition, the class nature of the choice is reinforced by the non choice condition imposed to most of the people: since its inception, the Brazilian automotive industry was never organized to be a mass industry, as the average income of most people is totally incompatible with automobile prices: the monthly minimum wage has been around US\$ 60 in the last two decades, while the less expensive cars have been priced between US\$ 6000 and US\$ 10,000.\* Therefore, most Brazilian people cannot even think about buying a car. Even if theoretically a ‘desire’ to buy an automobile may appear, it is almost as possible as to buy a boat or a plane, and impossible desires cannot be considered for policy analysis.

#### 4.1. State, industry and middle class interests

The sociological approach to the automobile has to be taken also in face of the role of the automotive industry in contemporary capitalist economies, through a macro-economic approach to the car industry. Here the sociological and macro-economic approaches to the automobile get together: the expansion of the Brazilian automotive industry would not have happened without an actual market for its products. As stated by Whitelegg, consumer demand for cars in many different societies cannot be adequately understood outside of an appreciation of state support for motorized transport and changes in the built environment which generate further demand for car ownership. (Whitelegg, 1981, p. 155)

The market was then organized through the generation of conditions for the emergence of a middle class which corresponded to the ideological and economic project of the proposed development model: on political grounds, the new middle classes played a vital legitimizing political role, especially during the authoritarian period, from 1964 to 1982. Key to the objective of market generation was the income concentration process (Bacha and Klein, 1989). In addition, a built environment which enhances the need for car use was also generated: large investments in new urban and regional highway systems were provided, while railways were dismantled and public transportation systems were kept subjected to permanent crisis (Barat, 1991; Figueroa, 1991). The development project envisioned middle sectors committed to a new lifestyle who would then use all tools thought to be necessary to drive to a better future. In this sense, one can talk about a *symbiosis* between the middle class and the automobile, for one cannot survive without the other. It is the longest lasting and happiest marriage of our times. In addition, one can talk about a mutual sustaining relationship between the built environment and the automobile. It is like a *trap*, within which the middle class was born and guided from its inception to understand that the dream of social mobility would be possible only with the automobile.

#### 4.2. Automobile demand in other countries

In developed countries, the same relationship between transport policies, urban structure and automobile dependence has been emphasized by several authors. For example, McShane and Koshi (1984, p. 104), analyzing the post — WWII increase in auto use in Sweden, stress that the publicly financed housing complexes were “located on the fringe of the cities, far enough from downtown centers to make the provision of other than public transport service expensive and

\*Considering permanent inflationary processes, it is difficult to arrive to a precise figure. However, the mentioned price reflects actual market conditions during the 1970–90 period.

impractical. Consequently, car ownership became a necessity... (this) mirror what was happening in the U.S. at that time and likewise credited with much of the responsibility for accelerating American auto dependency." This example suggests that inferred consumer desires should be taken more carefully when analyzing policy decisions. As pointed out by Pucher, observed travel behavior is not simply the outcome of consumer sovereignty. Indeed, in some cases, policies are so extreme, and choices so restricted, that the resulting travel behavior — in particular, mode of travel — is practically preordained.\*

In the US, the conjunction of economic prosperity, automobile subsidies (direct and indirect), urban residential policies and public transportation policies made transit impractical and automobile 'highly demanded'.<sup>†</sup> The built environment constrains the use of the car, as a survival tool, and relying on public transportation is irrational. As stressed by Rosenbloom when analyzing why North American families need cars, "...it is hard to see how any other option...[than the car]... could serve the complex travel needs of such families." (Rosenbloom, 1991, p. 39)<sup>‡</sup>

With capitalist European countries, the post WWII increase in auto ownership also led to pressures on more space availability for cars.<sup>§</sup> Although the rate of automobiles per capita is, on average, about 50% less than that of the U.S., the use of the automobile is very different, in the face of traffic restrictions, higher gasoline prices, high taxes on car sales and high parking fees.<sup>¶</sup> In addition, transportation policies share a more transit-oriented approach, that derives from both different historical and urban conditions, and from different political environments. Large public transportation systems — subways and railways — have long provided good transportation services. Moreover, governments have, for a long time, subsidized public transportation and supported non-motorized means such as the bicycle. In addition, the much higher urban land use densities historically found in Europe were maintained in new urban developments, for governments have been consistently supporting high-density occupation, served by public transportation means.<sup>||</sup> These policies reflect a different approach to transportation policies, and can be said to be directly related to a more complex political arena, where radically different views of society struggle around policy outcomes.

Developing countries pursuing industrialization and economic modernization, in spite of different social and political conditions, have been experiencing the same process that occurred in Brazil, with similar results in respect to urban transportation systems.\*\* In these countries, new middle sectors have been generated and the automobile technology has been replacing local transportation means. Car ownership has been confined to selected sectors and public transportation services have been subjected to permanent crisis (Figueroa, 1991). Sharp differences in trip patterns — with and without automobile — have been identified, reproducing the same differential forms of use of the space for circulation (Banjo and Dimitriou, 1990). A similar process can be identified in the former socialist countries (Pucher, 1993) as well as in China,<sup>††</sup> where public (and non-motorized) transportation systems have been losing space to cars.

Regardless of their deep social, political and economic differences, automobile demand in these countries should not be seen as a consequence of a generalized 'natural consumer desire', or as an 'inevitable outcome of progress.' The demand for cars should instead be related to the specific social and political conditions found in the countries, and to the regional, urban and transport policies that shape space and transport supply. The utility of the car stressed by the economic approach has to be complemented by the sociological analysis of who is buying automobiles, for what purposes and within which social and economic conditions. As with the case of Brazil, the increase in automobile demand in such countries, as South Korea, Indonesia or China, cannot be attributed to a sudden 'desire' for this technology, divested from all the social, political

\*Pucher, 1988, p.509.

<sup>†</sup>See, for example Barrett (1983) and Vuchic (1984). The former discusses the abandonment of public transportation systems and the latter stresses that automobile oriented policies pursued in the country were "by no means spontaneous desire of people...the choice (for the automobile) has been strongly influenced by biased policies..."(p.128)

<sup>‡</sup>She makes an interesting description of the U.S. case. However, she does not acknowledge that these families need the car because the built environment makes the auto indispensable and because there has been a powerful economic and political movement to support the automotive development model.

<sup>§</sup>Sachs, 1992; Dupuy, 1975.

<sup>¶</sup>Pucher, 1988.

<sup>||</sup>Pucher, 1988.

\*\*For the Asian case, see Spencer and Madhavan (1989) and Dick and Rimmer (1986).

<sup>††</sup>The growth of cars in China can be viewed in the traffic safety study made by Navin *et al.* (1994).

and economic conditions within it is offered as an alternative. Particularly in the poorer countries, and in countries with highly unbalanced income distribution, the access to the automobile will be related to the creation of limited middle class sectors, who will be able to join and benefit from the economic modernization. They will see the automobile as vital for their reproduction as social classes, and they will make large efforts to purchase it, establishing a mutually reinforcing relationship with the automotive industry. Accordingly, they will try to use cars as extensively as possible, reacting against old, slower transport modes hampering the efficiency of the automobile, as well as against any restraint by traffic authorities. In these countries, modernization will change travel patterns and a new balance between modes will result, changing living and travel conditions for everybody. The final position of the automobile in the transport market will be related to how middle classes will influence policy decisions and to how excluded sectors will manage to have their travel needs attended to by existing non-motorized and motorized public transportation means. The costs and benefits of all these complex changes have to be analyzed in every case, for every particular condition. This challenge could be considered by transport analysts, while using the sociological approach suggested here to better understand recent urban and transport changes.

## 5. CONCLUSIONS

Misunderstandings about the factors that influence car demand in developing countries have been leading either to conservative automobile-promoting policies or to frustrated efforts to promote voluntary shifts to transit. The inadequacy of prevailing views requires that better explanations be suggested, to support improved policy decisions.

The paper proposes an alternative sociological approach, that is intended to better explain the demand for cars in developing countries. It complements the economic approach based on the utility of the car, by analyzing social, economic and political conditions that surround both the supply of this specific technology in developing countries and the individual decisions to purchase it. In this respect, the paper stresses that the valuation of the car in developing countries cannot be fully explained by psychological, political or anthropological approaches of 'status' and 'power', neither by the traditional economic approach of free consumer choices.

First, simple explanations of the success of the car related to issues of status, power, sexual strength and privacy are superficial.\* Even considering that the car may be used as symbol of status in particular conditions, the decision to buy the car technology is socially determined and is seldom based just on the interest of demonstrating status or power: there are no psychological motives able to explain why so many people commit a significant share of their budgets, for such a long time, to buy such an expensive technology. These single factors are secondary and derive their explanatory power due to the large visibility from, and manipulation by, the media. Therefore, their use occurs in a parasitical manner in respect of the actual motives by which people in developing countries decide to purchase and use cars.

Second, the traditional economic approach neglects social differences and the actual political, economic and urban conditions in developing countries. Considering the long average distances found in large cities and the income distribution patterns, most people have no choice other than to use transit, making choice models meaningless. In addition, market failures abound in the transport sector and the option for the automobile is highly biased by the lack of proper alternatives. As shown in the case of São Paulo, the differences in efficiency and convenience between cars and buses are so great that the choice for the automobile appears inevitable for those who can afford it.

Therefore, a better explanation requires the analysis of specific social, economic and political conditions in developing countries which lie behind recent processes of capitalist modernization. In the contexts described in the paper, this economic modernization induced a new lifestyle for selected social sectors — the middle classes — that defined a clear dividing line with respect to working classes. This new lifestyle radically changed mobility needs, requiring increased incomes

\*The ownership of a car can be seen as a symbol of status in some portions of the lower middle class; the make of the car can also be seen as a status symbol for high income sectors; but these features do not change the much higher importance of the automobile as a means of class reproduction for most middle class people.

and better transportation means, significantly increasing the use of the automobile by the middle classes. In this respect, the paper proposes that the valuation of the automobile is better explained by the sociological perception, by the middle class, of the car as a vital means to guarantee its reproduction as class, in a context where physical and social mobility are the prime objectives. The car is a tool whose use is deeply embedded in social, political and economic constraints: behind the wheel, rather than 'people' there are political beings with needs and interests, and with a definite view of society, as ideology. In addition, the valuation of the car is explained by the particular urban, economic and transport policies promoted in developing countries: these policies have been shaping the contemporary space in the developing world in a way that induces the need for the car, while making alternate public transportation means impractical. Considering the prevailing built environment, the ease to use automobiles and the poor supply of public transportation means, the middle class has no alternative but to purchase and use the car intensively. If other conditions prevailed, fewer people in the developing world would commit a substantial part of their incomes to 'demand' cars, and the use of the automobile would be much more selective.\*

Hence, the decision to have and use cars is based on its utility, rather than on symbols of 'status', reinforcing the economic approach to the demand for the automobile. However, the demand is deeply constrained by the actual physical (urban space, transport supply), economic (transport costs and convenience), and political (class consciousness) conditions that surround the decision, enhancing the need for a broader sociological approach.

With respect to actual policy decisions, one can conclude that conservative policies designed to promote an automobile-oriented space as answers to 'free consumer choices' are unjustified in developing countries: the effective demand for cars is limited to selected sectors and highly influenced by urban, economic and transport policies. To interpret this biased demand from limited sectors as representing society's desire is technically mistaken and socially unacceptable, considering that prevailing urban and economic conditions transform most people in to public transportation captive users.

In respect to alternative transport policies, one can also conclude that the symbiosis between the middle class and the automobile in prevailing conditions presents enormous obstacles to changes in the current accessibility patterns in developing countries' cities. If the automobile is a means of reproduction of this class, there will be an immediate reaction against any limitation in its use. The reaction is therefore political, rather than psychological. Even when this resistance is exhibited on an individual basis — and reinforced by the prevailing superficial psychological and anthropological views — the underlying rationale represents class consciousness about the vital role of the car for its reproduction. In this respect, 'well intentioned' but wrongly approached policies to promote voluntary shifts to transit, or to increase auto occupancy, turn out to be a waste of time.† This reaction is reinforced by the middle class adherence to the ideology of increased social mobility, which translates into a desire for increased mobility in space and freedom to circulate. In addition, the accumulation rationale of the economic system set priorities for the automotive industry and its economic linkages. Consequently, powerful interests permanently induce an auto-oriented space and create obstacles to alternative technologies (Winner, 1977).

As a consequence, the actual social and environmental costs of cars seem very difficult to impose except in selected and limited sites, and the corresponding organization of a transit-friendly system, coupled with efficient non motorized transportation subsystems, will face enormous obstacles. There are plenty of traffic management alternatives to restrain the abuse of the automobile and to promote a more balanced urban traffic (May, 1986), however they will always confront reactions which are difficult to overcome. In the middle term, only the middle class concern with environmental issues appears as potentially encouraging significant changes, through the acceptance of travel pattern changes and automobile restriction measures intended to improve quality of life.

Finally, the sociological approach to car demand can be used to analyze similar processes in developed countries, in former socialist countries and in developing countries as well. The

\*For instance, the positive relationship between urban density and use of public transportation means was analyzed in developed countries by Newman and Kenworthy (1989).

†In São Paulo, the attempt to shift auto trips to special privately organized bus services has just failed, after two other unsuccessful attempts made with public buses (the first in the 1970s and the second in the 1980s). Similar attempts to stimulate carpooling in worktrips in the 1980s have also failed. See CMTTC (1992).

challenge for transport analysts is to reconsider existing interpretations of the demand for cars as expressing natural consumer desires, and search for better explanations on how the social, economic and political conditions in these countries influenced people's transport decisions.

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